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SOIL CONSERVATION

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ACRES ARE ACES

BY HUGH HAMMOND BENNETT

WHOLLY UNDRAMATIZED and obscured behind the spectacular military phases of the war are 4 billion acres of vitally important land—some rich, some fair and some poor, but all valuable . . . Twenty-five million acres in Australia, some 69,000,000 in Argentina, about 460,000,000 in Canada and the United States, 550,000,000 in Russia, and many other large and small areas in many continents and countries around the globe—these are the world's food-producing regions. A richer prize, by far, than the oil lands of the Caucasus, the iron deposits of the Urals and the gold veins of South Africa, they are the most important of man's earthly possessions.

. . . On this land, more than 2,000,000,000 people must depend for their food and clothing. Millions of these people have never had enough to eat. As the good land shrinks in area—and it is shrinking—their chances of ever getting enough to eat and wear are shrinking too. And not all of this . . . is good land by any means. Millions of acres have been virtually exhausted by centuries of continuous cultivation and erosion. Other millions have been damaged in varying degrees. The balance which has not been damaged and is not subject to erosion by wind and water is pitifully small—far less than the minimum of two and a half acres per capita now required to produce what we in America consider an adequate diet.

. . . The use to which the world's croplands are put after the war will decide in great measure what kind of peace we shall have. Under Axis domination, these lands would be used to feed and rebuild Germany and Japan, and perhaps Italy, at the expense of all others. Under United Nations inspiration, they would be used to support, in the words of Vice President Wallace, "a better standard of living for the common man, not merely in the United States and England but also in India, Russia, China and Latin America; not merely in the United Nations but also in Germany and Italy and Japan." . . .

Food, of course, is the first requisite for civilians and fighting men, but there are many other ways in which our farm lands contribute to arming our fighters. Glycerin, made from soybean oil, is used in firing shells. The oil of the castor bean is used as a binder for incendiary bombs. Cotton is used in parachute cloth and for airplane coverings, and cotton linters are soaked in nitric acid to make smokeless powder. There is as much wool in the mount of an 81-mm. mortar as in a woman's all-wool skirt. Sugar and corn yield the alcohol used in making smokeless powder. Peanuts contribute to the making of depth charges to blow enemy submarines out of the oceans . . .

The list of countries on the Axis side of the cropland balance sheet is long and impressive . . . With generous cropland allotment, the Axis total comes to an estimated 656,753,000 acres.

The list of croplands available to the United Nations is far more impressive—the U. S. S. R., England, Wales, Scotland, Northern Ireland,

(Continued on page 248)

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MORE MEAT with LESS LABOR by R.E. Uhland


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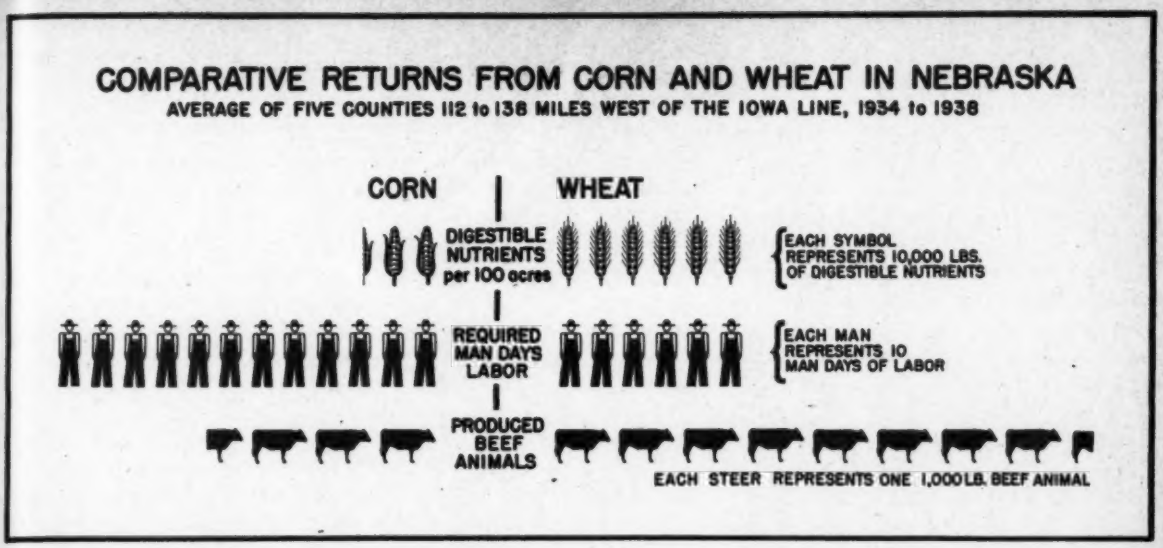

LABOR AND PRODUCTIVE LAND are solid bulwarks to the fighting democracies. Much depends upon the wisdom and efficiency with which we distribute our manpower and put to war work every cultivated acre. It will be shown in this article how in certain areas a shift in crops can work wonders in increasing the production of digestible nutrients, in effecting better conservation of the soil, and in reducing the amount of labor required.

DIGESTIBLE NUTRIENTS PER BUSHEL (OR ACRE)

Production records of the principal Corn Belt States—particularly Indiana, Illinois, and Iowa—show that larger returns of digestible nutrients *per acre* and *per man hour* are obtained by growing corn rather than wheat. From 1934 to 1941 an average of 1,656 pounds of digestible nutrients was produced for each acre of corn harvested, while in the same period wheat returned only 887 pounds of digestible nutrients per acre. A bushel of corn and a bushel of wheat, according to Morrison's "Feeds and Feeding," contain an average of 45.1 pounds and 51.2 pounds of digestible nutrients, respectively. Wheat contains more protein than corn. Therefore, when wheat is the basic concentrate in the feeding ration, less protein supplement is required to secure a proper balance.

DIGESTIBLE NUTRIENTS PER MAN HOUR

The returns for each man hour spent in growing corn were 89.5 pounds of digestible nutrients, as compared with 75.8 pounds from the same labor expended in growing wheat. The labor and equipment, however, used in growing wheat do not compete directly with the labor and equipment used in producing corn. In addition to supplying valuable feed as grain, wheat serves as an excellent nurse crop for clover and grass in the rotation. It protects the land against erosion and insures larger yields of all succeeding crops. Winter wheat can usually be advantageously grazed in the spring, contributing a great deal toward the production of beef and dairy products. Therefore, in the Corn Belt, center of livestock production, wheat and corn can be grown profitably, although the latter *in this area* produces more digestible nutrients per unit area.

The accompanying chart contrasts the returns from 100 acres of corn and wheat in five Nebraska

EDITOR'S NOTE.—The author is principal soil conservationist, Office of Research, Soil Conservation Service, Washington, D. C.

THE PICTURES

1. Oats and lespedeza protect the land against erosion and supply excellent feed with little labor and equipment. 2. This wheat made 30 bushels per acre in 1941 with less than 6 man-hours labor per acre. 3. Leaving the stubble on the surface protects the land against erosion and runoff. 4. This type of land should be in wheat and clover, not corn. 5. Little labor is required while this breeding herd grazes on 500 acres of brome grass.

FRONT COVER OF THIS ISSUE: Hogs being fed ground wheat with a protein supplement.

counties. These counties represent the fifth north-south tier of counties lying 112 to 138 miles west of the Iowa line. The production of wheat and corn is based upon county census figures. The labor represents only the man days used in production and harvesting. Results of feeding trials conducted by numerous experiment stations were used in calculating the beef that might be produced from feeding the corn or wheat from 100 acres. In the discussion that follows, the results of replacing part of the corn acreage of Nebraska and Kansas are projected. The figures show the increased beef and pork that may be expected if 20 percent of the 1943 corn acreage goal were to be replaced by wheat and the increased grain yield were fed to cattle and hogs.

County and State records show that in Nebraska during the 5-year period 1934 to 1938, and in Kansas during the 8-year period 1934 to 1941, wheat consistently yielded more digestible nutrients per acre than did corn. Feed trials reported by numerous experiment stations show that wheat can be fed safely to both cattle and hogs. The gains are as good, pound for pound, as from corn. In fact, wheat of good quality has been shown to be slightly superior to corn when fed to swine. In 16 experiments, pigs fed ground wheat and tankage, or some other protein supplement, gained 1.39 pounds per head daily on the average. Others fed shelled corn in place of ground wheat gained 1.27 pounds. In these trials, 100 pounds of ground wheat was equal in value to 97.7 pounds of shelled corn plus 3.2 pounds of tankage or tankage equivalent. Wheat gave excellent results when fed as the only grain to pigs on pasture. It also showed up well when fed with a protein supplement to pigs in a dry lot.

Considering all the data available, it may be concluded that for beef cattle whole wheat (which is ground before feeding) is worth about as much per ton as a good grade of shelled corn. It may be fed as the only grain, or in combination with corn. In trials at Missouri, ground wheat combined with a protein supplement and legume hay produced the same gain with from 5 to 15 percent less grain than was the case with either corn or barley. Preliminary figures supplied by the Bureau of Agricultural Economics indicate that in Kansas an average of 11.9 man-hours is expended in producing an acre of corn as contrasted to 4.6 man-hours for producing an acre of wheat. In Nebraska the average labor required per acre of corn is 11.8 man-hours while for wheat it is 5.7 man-hours.

Not only does wheat possess merit as a feed, but experiments show that the erosion losses from land cropped to wheat are much less than from land cropped to corn.

The production rates of digestible nutrients per acre for corn and wheat for different tiers of counties in Kansas and Nebraska are shown in table 1.

TABLE 1.—*Digestible nutrients produced per acre of corn and wheat in Kansas and Nebraska. (Average 1934 to 1938 for north-south tiers of counties beginning at Iowa line and continuing west)*

North-South tiers of counties	Nebraska		Kansas	
	Corn	Wheat	Corn	Wheat
	Pounds	*Pounds*	*Pounds*	*Pounds*
First tier	726	914	523	678
Second tier	618	803	505	723
Third tier	433	763	451	703
Fourth tier	325	678	419	743
Fifth tier	235	587	338	723
Seventh tier	280	607	63	181

The yields for Nebraska are based upon acres harvested; those for Kansas are for acres sown. The Nebraska yields appear higher, but records on planted acres were lacking. The yields of digestible nutrients from wheat were much greater than from corn in both States. The production of corn decreased steadily from east to west; the decreases in wheat yields were much less marked.

CALCULATED GAINS

Table 2 projects what might be expected if 20 percent of the 1943 corn acreage goal for Nebraska were planted to wheat. Were such a change effected, the calculated saving in labor on 1,612,000 acres would be 983,319 man-days. Since wheat supplies more digestible nutrients per acre than corn, this projected increased production of wheat, if fed to beef cattle according to recommended feeding procedures, would result in 62,049,400 pounds of live beef. If fed to hogs it would produce 83,082,750 pounds of live pork.

TABLE 2.—*Saving in labor and increase in production of beef or pork for 1944 that would result from projected replacement with wheat of 20 percent of the 1943 corn acreage goal in Nebraska*

North-south tiers of counties west of Iowa line	Corn acres replaced by wheat	Labor saved, man days	Additional production of beef	Additional production of pork
		10-hours	*1,000 lb.*	*1,000 lb.*
0 to 25 miles	309,504	188,797	8,083	10,829
26 to 53 miles	338,520	206,497	8,704	11,655
54 to 80 miles	398,164	242,880	18,242	24,436
81 to 111 miles	243,412	148,481	11,939	15,965
112 to 138 miles	125,736	76,699	6,145	8,231
178 to 232 miles	196,664	119,965	8,935	11,967
0 to 380 miles	1,612,000	983,319	62,049	83,083

The data indicate the possibility of increasing food production, particularly beef and pork, by replacing some of the corn acreage with wheat in the 1944 crop year. These calculations are based upon county census figures for 1934 to 1938. The

suggested increased acreages of wheat for the six tiers of counties are based upon the average corn acreage actually harvested during this 5-year period.

As noted in table 2, a substantial saving in man days of labor can be expected. If half of the 983,319 man days are devoted to the production of beef and pork, the other half can be spent in producing additional wheat on acres selected for their capability. In other words, if suitable land is available, the remaining 491,660 man days can be used for the cultivation of 862,560 additional acres of wheat.

It is reasonable to assume that these additional acres, having been selected according to the capability of the land, would have at least as high productivity as the wheat land in cultivation during 1934 to 1938. Therefore, it is surely probable that the grain harvested would be sufficient to produce 90,424,600 pounds of live beef or 121,104,500 pounds of live pork. It is, of course, recognized that supplemental feed will have to be used with either wheat or corn. The grazing, however, supplied by wheat in early spring frequently contributes a great deal toward the production of beef and dairy products.

A general plowing up of pasture or range land should be discouraged, inasmuch as good pasture supplies the cheapest and most economical feed for cattle, sheep, and horses during the growing season—a period when farm labor is always at a premium. Even for swine, pasturage is an important means of reducing the cost of feeding. Studies reported on 478 Corn Belt beef farms showed the breeding cows obtained practically all their feed from pasture 200 days of the year. Although pasture furnished a little more than one-half the total feed for the year, the cost of pasture was only one-third of the annual feed bill. Better yet, this pasture land enjoyed excellent protection against erosion and loss of fertility and required a minimum of labor.

Table 3 shows the estimated saving of labor, and the expected increase of beef or pork, that would result in 1944, were wheat grown in preference to corn on 20 percent of the 1943 corn-acreage goal in Kansas. The wheat acreage for the six north-south tiers of counties is distributed on the basis of the average corn acreage harvested there in the 5-year period 1934 to 1938. Since the corn acreage of Kansas is lower than that of Nebraska, the projected increase in wheat acreage is likewise less.

The calculated saving in labor from substituting for corn 722,025 additional acres of wheat is 527,078 man days. The *increase* in digestible nutrients from the added acreage of wheat, if used for feed, would result in 21,949,200 pounds of live beef or 29,420,900 pounds of live pork.

TABLE 3.—*Saving in labor and increases in production of beef or pork for 1944 that would result from projected replacement with wheat of 20 percent of the 1943 corn acreage goal in Kansas.*

North-south tier of counties west of Missouri line	Corn acres replaced by wheat	Labor saved, man days	Additional production of beef	Additional production of pork.
		10 hours	*1,000 lbs.*	*1,000 lbs.*
0 to 25 miles	157,402	114,903	2,370	3,179
26 to 53 miles	132,853	96,983	3,166	4,240
54 to 75 miles	145,127	105,943	2,438	3,266
76 to 105 miles	124,910	91,184	8,560	11,463
106 to 140 miles	98,917	72,209	4,420	5,199
271 to 301 miles	62,816	45,856	995	1,354
0 to 301 miles	722,025	527,078	21,949	29,426

If one-half the labor saved were spent in producing beef and pork and the other half used to produce more wheat, an additional 572,504 acres of wheat could be grown on well-selected land. On the basis of the relative distribution shown above, the digestible nutrients resulting from this added acreage of wheat would be sufficient to produce 52,914,200 pounds of live beef or 70,867,300 pounds of live pork.

The foregoing calculations indicate that replacing corn with wheat in a portion of the corn acreages in Nebraska and Kansas would result in a considerable saving of labor. At the same time, the digestible nutrients in the wheat produced on these acres would exceed those expected from an equal acreage of corn. Specifically, if 20 percent of the 1943 corn acreage goals for these two States were allotted to the growing of wheat, enough man hours of labor would be saved to permit the additional production of 228,337,400 pounds of live beef or 304,475,450 pounds of live pork.

SPRING WHEAT IN THE DAKOTAS

This year many farmers in the Dakotas are making a larger contribution to our food program by having increased their spring wheat acreage. According to State statistics, the average calculated return of digestible nutrients from land in corn for the 10-year period 1929 to 1938 was 617.9 pounds per acre in North Dakota and 527.7 pounds in South Dakota. One man hour of labor spent growing corn in North Dakota produced an average of 49.0 pounds of digestible nutrients as compared with a return of 61.8 pounds for spring wheat. In South Dakota the yield of digestible nutrients for each man hour of labor was 40.6 pounds for corn and 73.2 pounds for wheat. The average return of digestible nutrients from labor spent in producing spring wheat was 26.1 percent greater than for corn in North Dakota, and 80.3 percent greater in South Dakota. The yield of wheat for North Dakota was 401.6 pounds of digestible nutrients per acre and for South Dakota the yield was 431.7 pounds.

These yields are based upon harvested acres of both corn and wheat. Records for 32 counties in eastern South Dakota for the period 1937 to 1941 show that only 79.9 percent of the corn acreage that was planted in North Dakota was actually harvested, while 90.5 percent of the spring wheat sown was harvested. The average corn yield from planted acres was 1.5 bushels less than from harvested acres, while the yield of wheat from planted acres was only 0.68 bushels less than from harvested acres. These data indicate a higher abandonment or failure to harvest corn than wheat during this period of good crop years in South Dakota. Records also show a much higher abandonment of corn than wheat in the winter wheat areas, particularly during drought years.

Obviously, during the present emergency farmers in these States who are short of labor and have equipment for growing wheat have a better chance of producing more digestible nutrients as well as more beef and pork by seeding spring wheat on at least part of their corn land each spring.

CROPPING GOVERNED BY LAND, LABOR, AND EQUIPMENT

These findings from four States (Kansas, Nebraska, South Dakota, and North Dakota) show that replacing corn with wheat on a part of the land commonly devoted to corn will save labor and supply feed for the expansion of our livestock products. This applies particularly to the States bordering the western side of the Corn Belt.

There is also a conservation angle to be considered. Land cropped to wheat is much less subject to erosion than land cropped to corn. Wheat can be combined with soil-building crops such as clover, lespedeza, and brome grass, especially in those areas of highest rainfall. The latter crops furnish added protection to the soil against erosion. Increased yields of succeeding crops of corn and wheat will be obtained and pasture or hay for added livestock production will result.

The past 6 years have been exceptionally good ones, and production of nearly all important crops has been generally high. It is important, especially during the present emergency, that practical steps be taken to safeguard against the low production which may be associated with years of very light rainfall. The data offered here indicate that farmers in those States bordering the Corn Belt on the west can help to ensure the country against low food supplies by growing wheat on part of their present corn land. The labor saved by replacing corn with wheat can well be devoted to the production of livestock or livestock products.

Farmers in each community now will want to make a very careful study of their farming problems, and plan their cropping for 1944. They should take into account the available land, labor, and equipment and the possibility of producing livestock. Obviously, farmers in different sections of these bordering States will need to pay sharp attention to proper land use and cultural operations, as the advantage of wheat over corn varies according to soil and climate. In those sections where rainfall is frequently low, sorghums supply more forage and grain than corn. Throughout the central and southern parts of the Western Plains States, for instance, stockmen depend largely on sorghums for their winter feed.

ACRES ARE ACES

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Free China, the United States, Canada, Mexico, India, Syria and Lebanon, Egypt, Libya, Algeria, French Morocco, the Union of South Africa, Australia and New Zealand. As this is written, the fate of Tunisia, with her considerable bit of cropland, still hangs in the balance.

The total estimated cropland that the United Nations own or control in these countries is 1,356,218,000 acres. And to that we can add a substantial area in other countries of the United Nations family—Guatemala, Honduras, Costa Rica, El Salvador, the Dominican Republic, Haiti, Ethiopia, Nicaragua, Panama, Cuba, and some small colonial territories of several of the United Nations.

Finally, on top of all that, we can count the 23,000,000 acres of cropland in Brazil, which is participating in the war against the Axis . . .

Nor is that all. There are vast areas of land that are potentially suitable for agriculture in several of the United Nations, awaiting only development. In the United States, for instance, there are several areas of potential cropland, and a conservative estimate places the figure at about 30,000,000 acres. In the U. S. S. R. there are undetermined millions. In Brazil, with her great Amazon valley, there are other potential millions of acres which many authorities believe may be profitably developed for agriculture. And elsewhere, of course, there are other smaller areas . . .

(Continued on page 261)

SEED for CONSERVATION PRODUCTION

by C.R. Enlow

1. In Montana a stand of crested wheatgrass yields to the advance of a binder. 2. Kansas, where ingenuity is the rule rather than the exception, finds these new-type strippers doing an efficient job collecting the seed of sideoats grama, useful in the development of erosion-resistant pastures; the strippers are mounted on old automobile chassis. 3. And here is a glimpse of another pasture in the Sunflower State—a mixture of weeping lovegrass, sand lovegrass, little bluestem, sandhill bluestem, sideoats grama, blue grama, gallata, sand dropseed; it was seeded on former blow land in Morton County. 4. Combining seed in a big bluestem meadow; a good yield resulted, of both seed and hay.

ONE OF OUR TOUGHEST PROBLEMS of 1943 and subsequent years is to supply the need for seed of grasses and legumes. Expanded acreages of war crops—soybeans, peanuts, field beans, flax, corn, potatoes, and other items—have come to some extent at the expense of hay and pasture. Yet, hay and pasture are particularly vital to the increased production of livestock and livestock products. These same meadows and pastures are also the source of much of our seed supplies, and the demand for feed makes it particularly difficult to pass up a hay crop or withhold a pasture from grazing long enough to produce a seed crop.

The production in 1942 of seed of such staple legumes as alfalfa, red clover, alsike clover, and sweetclover, dropped materially below that of 1941 and it is estimated that the amount of seed on hand is entirely inadequate to meet the demands for 1943.

EDITOR'S NOTE.—The author is chief, Agronomy Division, Soil Conservation Service, Washington, D. C.

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Barely half enough red clover seed is in sight, approximately 60 percent of the alfalfa and alsike clover, and about 70 percent of the needed sweetclover. Seed of other grasses and legumes is short and it will be very difficult for farmers to harvest ample quantities of seed when they already have a tremendous food production program to keep them busy.

UNUSUAL DEMANDS FOR SEED

If it is expected that the yields of the needed food and feed crops are to be maintained, it is essential that crop rotations be followed. The high yields of the war crops that have been obtained have resulted largely because these crops have been rotated with grasses and legumes. A shortage of seed of grasses and legumes and the pressing need for increased acreages of other crops at this time may make it necessary to shorten rotations beyond the safety point for conserving the soil, but increased acreages to get more production of war crops will do no good unless we can keep up acre yields. There is no substitute for grasses and legumes for this purpose.

In addition to the need of grass and legume seed for crop rotation work, it is particularly important that all possible acreages be planted to supplemental pasture crops of sudan grass, sweetclover, lespedeza, rape, millet, and other crops as insurance for continued livestock production, should drought seriously affect the production of the already reduced acreage of perennial pastures. Ample feed is essential to maintain milk production and livestock gains, and it would be tragic if feed supplies should run low because of lack of seed to plant the crops. Protein feeds for livestock are scarce right now, and supplemental pastures will help materially to overcome the shortage.

Green manure crops are also particularly valuable at this time as a source of nitrogen for crop production because of the heavy drain on the supply of nitrogen for fertilizer, munitions, and other war needs. Cover crops to prevent erosion, leaching, and to maintain production of orchards, vineyards and field crops, are particularly important. Further, there are still large areas of formerly cultivated land in the Great Plains and other sections of the country that are now bare or producing nothing but weeds, that should be revegetated immediately in order to furnish much needed livestock feed. Seed is the first essential to get green manure and cover crops and to accomplish revegetation.

The armed forces have, during the past two years, developed hundreds of cantonments, airfields, ordnance plants, forts, and other types of units that add up to a tremendous acreage. In the construction program, it has been necessary to destroy vegetation that must be reestablished to prevent wind and water erosion and to facilitate military action. Millions of pounds, principally of grass seed, will be required to revegetate these areas. The scarcity of grass seed adapted to the seeding of airfields and other units of the armed forces is evidenced by the fact that a short time ago it was necessary to remove from the market all the carpet grass and Bermuda grass seed in the country in an attempt to acquire a sufficient quantity for the Army and Navy.

Under lend-lease we are purchasing and shipping to England, Russia, and several other allies, millions of pounds of seeds of all kinds, from vegetables to grasses and alfalfa. This has made a heavy inroad on our seed supplies. Many kinds of seeds are now being exported that were being imported only two or three years ago.

It is not possible to estimate accurately in advance all of the needs for seed. For this reason it has been proposed that a stockpile for seeds of all kinds be developed to take care of any demands that may arise. To meet all the needs mentioned previously and at the same time develop a reserve stockpile is indeed a tremendous undertaking. During the war and undoubtedly for some time afterwards, there will be quite a demand from other countries for our seeds, and it seems logical that we should be prepared to meet such an emergency.

ACCOMPLISHMENTS TO DATE

The Department of Agriculture, a short time ago, officially recognized the grass and legume seed shortage by establishing floor prices for 20 of our legumes and grasses. These are Northern alfalfa, 30¢; Central alfalfa, 28¢; red clover, 25¢; biennial white sweetclover, 7¢; biennial yellow sweetclover, 6¢; biennial mixed sweetclover, 5¢; alsike clover, 22¢; timothy, 4½¢; smooth bromegrass, 11¢; orchard grass, 18¢; crested wheatgrass, 10¢; blue grama, 10¢; side oats grama, 10¢; buffalo grass, 50¢; Bermuda grass, 20¢; dallis grass, 20¢; bahia grass, 20¢; meadow fescue, 10¢; slender wheatgrass, 10¢; western wheatgrass, 8¢; and ladino clover, 65¢ per pound on the basis of clean seed. The price support is in the form of a loan that may be obtained on the seed in case the market price is low. It is hoped that other seeds may be given supporting prices as the need may arise. Farmers will undoubtedly be more willing to harvest seeds when they have assurance of a definite price with a chance of getting a higher price per pound of seed.

The Agricultural Adjustment Agency has for some time been contracting for the production of

cover-crop seeds in order to get increased supplies for more widespread use in the Southern States. This has resulted in a tremendous expansion of the acreage and production of vetches, Austrian winter peas, and crimson clover. Due to the very wet season in the Pacific Northwest last fall, however, it was impossible to make extensive seedings. As a result, the outlook for a good seed-production program of the vetches and Austrian winter peas for 1943 is not bright at this time. Plans are under way for a purchase program of several legumes, seed of which is produced in the Southern States, and this should materially aid in increased production.

Arrangements have been made by the Department, through vegetable seed processors and producers, to expand the production of vegetable seeds this year for both domestic and lend-lease purposes. This move has also hinged around supporting prices to farmers in order to get increased production. With the vegetable seeds, however, it is customary to contract for acreages and for that reason it is a much less difficult problem to get the desired quantity of seeds produced.

ADDITIONAL EFFORT NEEDED

In spite of all of the recognition of our needs and steps taken so far to encourage production, it is quite evident that it will be necessary, through the press, radio, and by group meetings and individual contacts, to encourage the farmers to produce more seed. Already there is serious competition for land by the various crops that are in demand and it is not likely that farmers will be particularly enthusiastic to go in for extensive seed production when they are already taxed to the limit to meet the acreage goals for other crops in face of both machinery and labor shortages. In addition, much of the seed of alfalfa, red and other clovers, and many of our grasses are harvested from regular hay fields and pastures. These hay fields and pastures are at a premium at this time because of the increased livestock and livestock products program. Seed cannot be procured without passing up the opportunity for grazing a pasture or cutting a hay crop and under present conditions farmers will be rather unwilling to pass up a possible income from hay or pasture in order to gamble on a seed crop. Seed production, even with good prices assured for seed, is generally a gamble because of the possibility of damage or destruction of the seed by insects, disease, hail storms, or by wet weather just at the time the seed should be harvested. Equipment for harvesting and processing seed is not too plentiful and will be exceedingly difficult to get at this time. In spite of all these handicaps, the seed somehow or other must be produced and it can only be done by an intensive campaign. Seed is the basis of plant production. Without seed, we cannot expect to produce the bumper crops we need next year.

During the past few years there has been a widespread seed production program in soil conservation districts in many sections of the country where little or no seed has previously been produced. Throughout the South, millions of pounds of seed of legumes and grasses, including crimson clover, bur clover, crotalaria, annual and perennial lespedezas, blue lupine, Singletary peas, Austrian winter peas, hairy vetch, and several others, have been produced. In the Northeastern States, ladino clover, improved strains of red clover, timothy, bromegrass, orchard grass, birdsfoot trefoil, and others, have been in demand and seed stocks are increasing. These and other grasses and legumes are also being produced in the Corn Belt and in the great seed-producing areas of the Pacific Northwest, and in the Great Plains there has been an extensive seed program in connection with crested wheatgrass, bromegrass, blue grama, buffalo grass, the bluestems, and many others. Now that supporting prices have been established for many of these seeds, with opportunities for establishing others as the need may arise, further expanded production will be possible if sufficient effort is put behind the campaign.

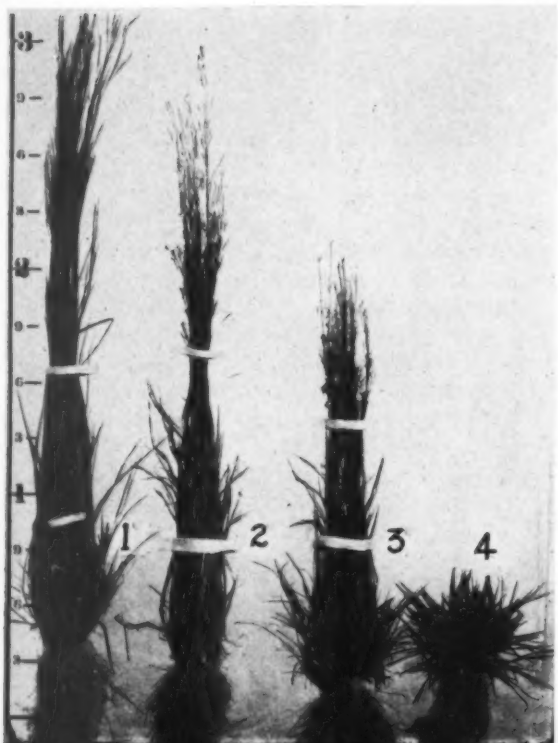
In connection with the establishment of supporting prices, recognition has been given to improved certified strains and varieties. Wherever there is a fair quantity of improved seed available, the supporting prices have been established for increased production of these strains at a price from 4½ cents to as much as 20 cents per pound above ordinary seeds. This applies in the case of alfalfa, red clover, biennial white sweetclover, biennial yellow sweetclover, timothy, smooth bromegrass, orchard grass, Bermuda grass, bahia grass, and meadow fescue. This is a wonderful opportunity to encourage certified seed production. Some of these improved strains are highly productive and should be increased as rapidly as possible.

The Nursery Division of the Soil Conservation Service has arranged with the Bureau of Plant Industry, the State experiment stations and the Crop Improvement Associations to use the nursery facilities to increase seed of improved strains and varieties so that a sufficient quantity of seed may be obtained to place with farmers for immediate production. It has always been extremely difficult to project a small quantity of improved seed into commercial production and the soil conservation nurseries are now attempting to fill this gap which

(Continued on page 261)

NURSERIES' PART IN WARTIME SEED PRODUCTION

By Harry A. Gunning[1]



Care must be exercised in selecting locally adapted strains of grasses. Here is shown a typical response with native species. Grown at Elsberry, Mo., little bluestem seed sources are (1) Stillwater, Okla.; (2) Manhattan, Kans.; (3) Moorehead, Iowa; (4) Mandan, N. Dak. The Oklahoma source seed does not mature seed at Elsberry.

DURING 1933 and 1934 the Soil Conservation Service operated over 100 plant production nurseries and carried on extensive native grass and tree seed collecting programs in every State and nearly every county. Many of the nurseries consisted simply of an acre or two of land convenient to a CCC camp, where a few thousand black locust seedlings were produced for local use. Seed collecting was then usually an unorganized gathering of material without regard to quality, knowledge of the species, or consideration of the labor cost. To meet the widespread demand, enormous amounts of planting materials were assembled. Many of the old CCC work areas and demonstration projects are now clearly defined by plantations of thriving trees, four, six, and eight years old—a real monument to the work done at that time. Gullies were stopped with kudzu plants, waste areas were protected by grass and legume seedings and, most important of all, there was developed an appreciation of the fact that plant cover is the most effective means of controlling erosion.

In 1935, the Nursery Division was made responsible for supplying all the planting stock required for Service operations. The small, widely scattered nurseries were consolidated into 30 large units. *During the period 1935 to 1942 the nurseries produced approximately 900,000,000 usable nursery-grown plants, an average annual production of nearly 125,000,000!*

Seed collection also was assigned to the Nursery Division. Needs of work units were ascertained, and a system established for collecting, purchasing or growing required materials. The nursery units, well spaced throughout the country, took over these functions within their operative radii. Special seed collecting equipment was developed. *During the period 1935 to 1941 nearly 5,000,000 pounds of native grass and legume seed were collected and supplied to field work units of the Service.*

The war has had a pronounced influence on our nursery work and objectives. Insistence that every farmer put his every effort into food and fiber production, the shortage of farm labor, the closing of CCC camps and the elimination of WPA funds all contribute to a reduced production and use of woody plant materials. No matter how keen the farmer's interest may be in planting waste areas to trees and in establishing shelterbelts or windbreaks, his time is limited and his regular operations largely monopolize his attention. Amazingly, however, the farmer's interest in tree planting has not decreased in proportion to these stringent demands. Now that money is more plentiful and crop prices are good, the farmer is interesting himself in permanent improvements of this sort. In tree planting, he finds the best use for certain areas and a high road to long-term objectives without neglecting the demands of the moment. The Nursery Division helps to keep this interest alive by continuing to supply woody planting materials to SCS work units in proportion to the farmer's desire to handle the material and the division's ability to produce the stock.

[1] Editor's Note: The author is Chief, Nursery Division, Soil Conservation Service, Washington, D. C.

African love grass, Tucson soil conservation nursery.

The trend in Service use of grass and legume seed for soil and moisture conservation is exactly opposite. The demand for more livestock and livestock products emphasizes the necessity of pasture, range, and meadow improvements. Increasing quantities of grass and legume seed are being asked by soil conservation districts for this and related soil and moisture conservation purposes. *Preliminary estimates indicate that as much as two million pounds of seed could be used advantageously by soil conservation districts and land utilization projects during the fiscal year 1943.* This is more than twice the quantity used in 1942.

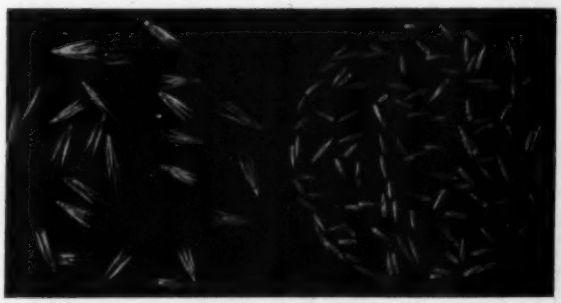
Prompted by the demonstrated value of grass and legume seedings to the food-for-freedom program, the Service will make every possible effort to meet the heightened demands for seed. Current transportation difficulties and labor shortages, however, make our goals seemingly unattainable unless our efforts are supported by hearty and intelligent cooperation in local seed-usage centers. Accordingly, two supplementary sources of procedure have been formulated: (1) provision for the establishment of seed-increase plantings of superior grasses and legumes in soil conservation districts, as a source of improved seed stocks; (2) the utilization of available resources within districts for the general production and collection of seed.

Recently, the Department of Agriculture developed a plan to encourage farmers by price stabilization and market assurances, to grow grass and legume seeds. These seeds are needed not only to meet domestic requirements but for Lend-Lease and for reseeding newly developed Army and Navy cantonments, airfields and camps. Seeds supplies of most of our commercial grasses and legumes are far below normal requirements and unless a sustained annual production is maintained our livestock production unquestionably will suffer.

Big blue grass on Oregon land previously cropped to wheat alternated with summer fallow for about 40 years. Yield, about 500 pounds per acre.

Increase field of big bluegrass on Pullman, Wash., nursery, developed by observational testing out of several dozen accessions collected in the Pacific Northwest. Estimated yield not less than 400 pounds per acre.

Strains of Canadian wild rye from—right to left—Caldwell, Idaho; Bozeman, Mont.; Saskatchewan, Canada; Yakima, Wash.; Oroville, Wash. Wide variation indicates wide conservation uses.



Bulbous barley; typical threshed spikelets at left, de-awned seeds at right.

The Soil Conservation Service is in an excellent position to help in the situation. Pasture, range, meadow improvement, grass-legume rotations and revegetating erodible land are accepted soil conserving practices which have been emphasized in the farm plan and in our work with soil conservation districts. To encourage such practices, we have demonstrated their feasibility, have designated the species of grasses and legumes to use and the proper methods of establishment. We have supplied seed of those species not readily obtainable commercially. We have made it possible for farmers and districts to establish seed plots as local sources of planting material. We have provided seed of improved strains and selections. We have provided technical assistance and in some instances machinery, so that the farmers within districts may harvest seed for their revegetation programs. Stimulating seed harvesting through soil conservation districts will in itself be a simple and effective step in helping to meet the national world-wide shortage.

The new seed program of the Department lends impetus to one phase of research desired by agricultural workers for many years. Improved strains and varieties will receive premium support prices under the program which has received State approval. Thus, the work of the plant breeder becomes recognized and the farmer who grows the higher quality product is rewarded proportionately. The incentive thus given to grow improved selections of grass and legume seeds is expected to be far-reaching in its effect upon seed, forage, and hay production.

The observational work of the Nursery Division has as its primary objective the finding of better plants for erosion control purposes. By cooperative agreements and mutual understanding, we work closely with the Bureau of Plant Industry and the State experiment stations in an endeavor to bring new plant materials resulting from breeding and selection direct to the farmer. In our observational nurseries promising grasses, legumes, and other plants are assembled from all possible sources. We make these plant materials available to the plant breeders for study and hybridization. Our facilities and land are available for maintaining foundation seed stocks and, with the consent and approval of all cooperating agencies, selections, strains, varieties, and species are increased to quantities sufficiently large to be rapidly extended for general farm production. Thus we bridge the gap between research and the application and use of research on the farm.

Our several administrative regions arrive in various ways at about the same common objective. The district seed plot plan is in nearly universal use. It provides an organized procedure under which farmers are selected by the supervisors of soil conservation districts to receive foundation seed stocks produced in Soil Conservation Service nurseries—seed stocks originating from cooperation with other bureaus of the Department and the State experiment stations. In some instances, soil conservation districts have rented or even purchased land upon which they cooperatively undertake the production of certain species of grasses and legumes wanted for revegetation work within their confines. Elsewhere, the Service has supplied individual farmer cooperators of the district with small quantities of seed for establishing farm seed plots. Usually, the farm seed plot is merely for the purpose of providing material for additional planting on the one farm. The three forms of procedure lend themselves well to the present effort of the Department.

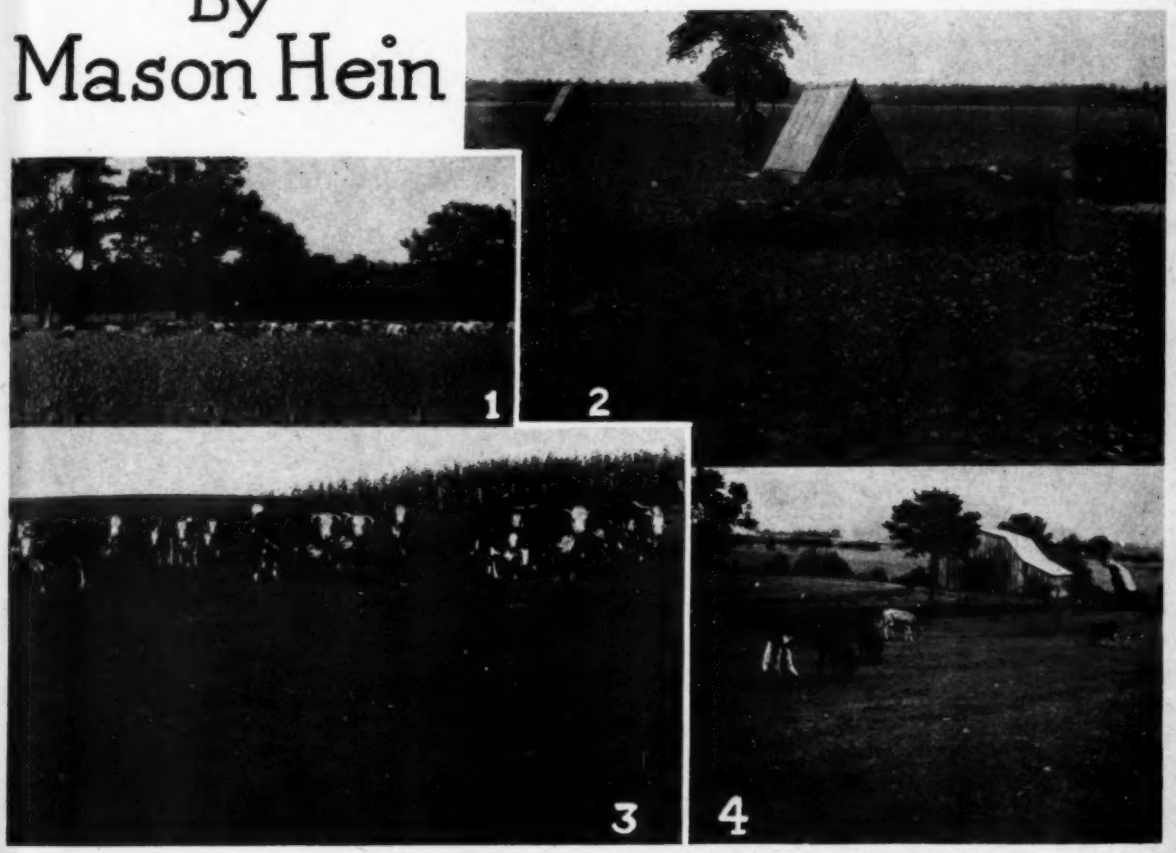
The district seed-plot plan will in all probability be most effective in stimulating seed production. Under this procedure the seed to be increased within a given State is selected with the concurrence and cooperation of both State and Federal agencies. It must have passed all adaptation and comparison trials and be acknowledged as superior to ordinary commercially available varieties. The seed growers are selected by the district supervisors and approved by the State and Federal agencies. Growers, and the land to be used, must comply with and maintain standards which will permit certification of the seed, if and when desired. Foundation seed stocks will be maintained in SCS nurseries as long as the cooperating State and Federal agencies deem it desirable.

Fostered and facilitated by the nursery, agronomy, and range divisions of the Soil Conservation Service, the Divisions of Forage Crops and Diseases and Dry Land Agriculture of the Bureau of Plant Industry and the State agricultural experiment stations and Extension Service, the district seed-plot plan is expected to prove to be one of the most effective programs of the Department for promoting conservation farming and increased food production.

J. C. Stapleton, Trough Creek, Pa., avers that contour strip cropping has increased the yields on his farm by 20 percent in 3 years. Contour furrows, liming and fertilizer, doubled the carrying capacity of his pastures. He has been increasing his beef herd steadily and has more and better feed for them each year.

TEMPORARY PASTURES for WARTIME PRODUCTION

by Mason Hein



1. A Carolinian Sudan grass pasture. 2. Rape pasture making pork in Maryland. 3. Tennessee whitefaces find this lespedeza good grazing. 4. Poor cows nibble at a not-so-good native pasture.

TEMPORARY PASTURES are those used for grazing during a short period, usually not more than one crop season. They are of very diverse kinds to meet regional and climatic demands, and their value for maintaining livestock production has been well demonstrated in the past. During periods of drought, they have been particularly effective and have saved many a fine herd from disaster. The emergency that now exists has nothing to do with drought, but *the American farmer has been asked to increase his production of meat and dairy products, and the use of temporary pastures is one of the measures he can take to help him comply with this request.* Temporary pastures may be used for all or a part of the grazing season and are valuable stabilizers of seasonal production. They may be seeded in early spring, about corn-planting time for mid and late summer use, or in early fall for late fall and early winter grazing. This gives the farmer a wide choice of crops for this purpose. The exact time of seeding and the period of availability for pasture of the various crops used will vary with the regions where used.

A crop that may be grown in practically all regions of the United States, except in the extreme

EDITOR'S NOTE.—The author is senior agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering, Washington, D. C.

north, is Sudan grass. Sudan grass plantings should be delayed until the soil is warm, which is usually shortly after corn planting time, and planted any time thereafter, depending on the length of the growing season. Under dry-land or semiarid conditions, plantings should be made early, since soil moisture may be lost, resulting in poor germination and uneven stands. Under favorable conditions, this grass is ready for grazing 6 or 8 weeks after seeding, but should not be grazed until it has reached a height of 8 to 12 inches. In Wisconsin, it has been recommended that grazing be delayed until the growth is two or three feet high, because in the less mature growth, or where the plantings have been stunted by heat or drought, some injury to livestock due to Prussic acid poisoning has been sustained under their conditions. For maximum returns rotation grazing is recommended, and to prevent injury from trampling, it should not be grazed after heavy rains or irrigation.

The pasture season of Sudan grass varies from 45 to 100 days. Depending particularly upon soil and climatic conditions, Sudan grass has a carrying capacity of two to three animal units per acre. This ideal summer temporary pasture should be used extensively, since seed is cheap and plentiful.

In the extreme North, where Sudan grass is not so well adapted, Japanese millet is a good substitute, or adapted varieties of foxtail millet may be used. The millets make very rapid growth, and can be seeded in late spring or early summer and still produce a satisfactory crop. The foxtail millets are better hay than pasture crops, because of their slow recovery after grazing. Japanese millet, where adapted, will probably be more productive.

Soybeans, an excellent forage for pasture or hay, make a desirable combination with Sudan grass. While such a mixture will not produce a greater yield than soybeans alone, the combination makes an ideal pasture.

In the South, pearl millet is one of the best temporary summer pastures. It makes a very good growth on ordinary soils without fertilizing. It can be planted any time from April to June. In general, the crop is not affected by disease or insect pests, and, for this reason, it may be more productive than Sudan grass, since common Sudan grass is rather severely injured by foliage diseases. The grazing of pearl millet should start when the plants are eight to 10 inches high. When the grazing is delayed, the plants go to seed, and the grazing season is automatically shortened. At Tifton, Georgia, pearl millet has carried better than one animal per acre from early July until mid-September, with gains of almost 150 pounds per acre.

Any of the adapted varieties of annual lespedeza makes ideal temporary pasture during the summer months, in regions where they do well. In Missouri, extensive use is being made of Korean lespedeza as a summer supplemental pasture. The Korean lespedeza is sown in the small grains in the spring, or where it has been seeded previously, it will volunteer under proper management, in the small grain plantings. Spring seedings of grass-legume mixtures in small grain may also furnish some temporary pasture in late summer, without injury to the succeeding year's growth.

For temporary fall pastures, the cereals—rye, wheat, winter barley, and winter oats—are the most desirable crops, where adapted. They may be seeded alone or in combination with vetch, crimson clover, or bur clover. If planted in late summer or early in the fall, 2 to 5 weeks' grazing may be obtained before winter retards the growth. In the south, the season will be longer, and it is possible, under favorable conditions, to have some grazing during every month in the winter. Rye, because of its winter hardiness and ability to withstand cold, can be seeded over a much longer period than other fall-sown cereal crops. Depending upon the region, fall-sown crops of wheat and rye will provide 2 or 3 weeks' grazing late in April, and then may be allowed to mature for grain harvest. The spring grazing of these winter cereals may benefit the crop where there is excessive straw growth, otherwise yields of grain may be reduced.

In Rhode Island, it was found that winter rye, planted at 10-day intervals from August 10 to September 20, furnished pasture from October 1 to October 25 in the fall, and from May 1 to June 10 in the following year. Wheat under similar conditions was less productive. The rye furnished sufficient grazing to carry two cows per acre in the fall for 2 weeks and for 5 weeks in the spring. At Tifton, Ga., Abruzzia rye furnished grazing from February 4 to April 14, while winter-sown oats furnished grazing from February 2 to May 6. The oats gave a slightly higher gain per acre than the rye.

Oats is one of the most palatable and nutritious of the cereals, and will furnish later seasonal grazing than any other cereal. Oats may be seeded in the fall in the south, and seeded earlier than other cereal crops; in the north, spring seeding is best. It does well seeded alone. In some sections, oats and field peas make an ideal combination, particularly on the more fertile soils. For swine or sheep pasture, Dwarf Essex rape may be added to the oats. The oats will supply the early grazing, and the animals will, no doubt, like it better than the rape. The rape will furnish desirable pasturage for midsummer and often

until early fall, after the oats has matured or been consumed.

Where adapted, legumes such as alfalfa, sweetclover, red clover, or Korean lespedeza may be seeded at the same time and with the oat crop, or seeded in the spring on a fall-sown cereal crop. The alfalfa and clovers may give some late summer pasturage the first season without injuring the next season's growth.

Italian ryegrass may be used, but it is not so productive on unfertilized land as oats or rye. Italian or common ryegrass seeded with small grain makes an ideal combination for temporary fall and spring pastures. The ryegrass makes a very good bottom growth, and, at the same time, adds to the production. Ryegrass alone, or in combination with crimson clover, is an ideal fall and spring temporary pasture in the central latitudes on the more fertile soils. Because of its extensive root system, it is also very desirable for soil improvement and conservation purposes.

The Utah Station has recently reported on the use of common rye for temporary or supplemental pasture for their cattle and sheep range land. The planting of rye on sagebrush land depleted of grass cover is proving to be a very desirable practice. The land is plowed with a one-way disk, and, at the same time, 25 to 30 pounds per acre of rye is seeded. The cost of plowing and seeding amounts to approximately $1.25 per acre. The plowing kills approximately 90 percent of the sagebrush, but this material is left in place to protect the land against erosion. This rye pasture will furnish spring grazing for 1 month to 6 weeks, and at a time when the sheep are being moved from the desert range or the cattle from the feed yards or from winter grazing, and is adapted to areas of moderate elevation where the grass cover has been reduced by overgrazing or drought. It also has been found that this type of management has increased the lambing percentage, and the marketed weight of the lambs.

To insure the best returns from these temporary crops, adapted varieties must be used. Foliage diseases, rust, or smuts may severely injure the growth and defeat the whole program. Too much emphasis cannot be placed upon using improved strains or varieties where available. The State experiment station, extension agronomist and county agent are in touch with local sources of seed, know the best varieties to use, and can help you to get them.

Finally, temporary pastures are not only effective in insuring maximum production, but they are also ideal for preventing soil and water losses. They are vital to any good soil conservation and pasture program, in that they improve the soil, prevent run-off, and at the same time, are most useful in stabilizing pasture production throughout the growing season. The temporary pastures will protect the permanent or semipermanent pastures from overuse and injury, and more than pay their way toward meeting production demands.

Use of fertilizers is just one of many practices that are necessary to good farming. Careful attention to the other practices is essential if fertilizers are to be used efficiently. This means erosion control; good cultivation; good seed of high-yielding, disease-resistant varieties; rotations that include enough legumes; liming acid soils; conservation and use of manure.

The farmers of this country are now being asked to produce unprecedented quantities of food, feed, fiber, and raw-material crops and they must do this under the handicap of labor and machinery shortages. For this reason they are trying to use every available means of producing at the lowest unit cost possible. It is indeed fortunate that fertilizer supplies for this season have not been too seriously curtailed.—

THE EDITOR.

FERTILIZERS FOR 1943

BY H. R. SMALLEY[1]

THERE WILL probably be nearly enough fertilizer for all crops grown in 1943 with the exception of certain crops of lower food value or of which there are large surpluses. However, *to make sure that all available fertilizer is equitably distributed* and used to the best advantage, a plan of distribution has been developed by Federal and State agencies in cooperation with the fertilizer industry.

Fortunately, we appear to have nearly enough phosphate and potash fertilizers; but owing to the fact that nitrogen is used to make explosives, our domestic production, although greatly expanded, has not been sufficient to supply all of our fertilizer needs and we are still importing large quantities of Chilean nitrate to make up the shortage. *If imports of Chilean nitrate of soda are maintained* during the next few months, nitrogen supplies for the 1943 season will be reasonably satisfactory—much better than seemed possible a few months ago. Even so, however, there may not be enough of all kinds of fertilizer to meet the heavy prospective demand, and it has been necessary to plan its distribution carefully to prevent some farmers from getting more and others less than their fair share of the available supply.

[1] Chief Agronomist, The National Fertilizer Association, Washington, D. C.

FEWER GRADES

The first step taken was to reduce the number of grades of mixed fertilizers that can be sold in the important fertilizer-using States in the interest of economy in manufacture, distribution, and use, and to select grades that average somewhat lower in nitrogen content than the grades formerly used.

In selecting the grades which are being sold this season, the recommendations of agronomists and horticulturists of State agricultural colleges and experiment stations were considered at regional conferences. These conferences were attended by representatives of USDA, WPB, State agricultural colleges and experiment stations, State departments of agriculture, farm organizations, and fertilizer manufacturers. For varying reasons, some changes in the recommendations were made, but in the main the grades finally selected are those that agronomists and horticulturists recommend for use under present supply conditions. In many cases they are not the grades that will be recommended when plenty of nitrogen is again available.

The second step in nitrogen conservation was to prohibit the use of chemical nitrogen in fertilizers for fall-sown small grains to be harvested for grain and for such nonessential uses as golf courses, lawns, parks, etc.

This order also prohibits the use of chemical nitrogen in mixed fertilizer for spring-sown small grains to be harvested for grain, but nitrogen materials can be used for top-dressing both fall-sown and spring-sown grains, and mixed fertilizers containing chemical nitrogen may be used as top-dressing on fall-sown small grains.

PRICE CONTROL

In some regions by special action the Office of Price Administration has permitted small increases in fertilizer prices, but these increases were allowed only to cover some of the increased cost of materials and transportation. Manufacturers must absorb increased labor and other costs. Fertilizers are still relatively low priced, however, as compared with prices of other commodities the farmers buy or with prices of farm products.

APPLICATION FOR FERTILIZER

Each farmer who uses fertilizer in 1943 is required to apply for it by filling out a simple form stating how much fertilizer he used in 1940–41 and on what crops, how much he needs in 1943 and for what crops. If for some good reason 1940–41 figures are not available, the 1941–42 figures may be used instead. He must also state how much fertilizer he has bought since July 1, 1942, and how much, if any, he has on hand.

Each fertilizer manufacturer is required by Food Production Order No. 5 to distribute the fertilizer which he manufactures and the chemical nitrogen materials allocated to him equitably among his customers but with due regard to the requirements of the crops now designated as "A Crops" by the U. S. Department of Agriculture.

Each farmer who desires to buy fertilizer should go to the agent, dealer, or manufacturer from whom he purchased his fertilizer last year and make application in the manner described above. If he is farming a different farm from the one he farmed last year, he should apply if possible to the agent, dealer, or manufacturer who supplied fertilizer for that particular farm during 1941–42. If this is not possible or practical, he may apply to any other agent, dealer, or manufacturer who has enough fertilizer at his disposal to supply his old customers and this particular new customer. The fertilizer industry has pledged itself to make every effort to take care of these unusual situations with fairness to all concerned.

The order provides that, in general, farmers will be required to buy mixed fertilizers containing somewhat less nitrogen than they formerly used, but there are many exceptions to this general rule, particularly with reference to the Group A vegetable crops for which every effort will be made to supply normal nitrogen content in mixed fertilizers and normal quantities for side- and top-dressing.

CROP GROUPINGS

The Group A crops are: Field crops—castor beans, cotton varieties normally stapling 1⅛ inches or longer, fiber and seed flax, guayule, fiber and seed hemp, hybrid corn for seed production only, peanuts and soybeans; vegetable crops—dried beans, snap and lima beans, beets, cabbage, carrots, kale, onions, all peas, peppers, Irish and sweet potatoes, spinach, sweet corn, tomatoes, and vegetable seeds; other crops—tung, and prunes, figs, raisins, apricots, and peaches for drying.

Group B crops are defined as all crops except those in Group A and those on which the use of fertilizer containing chemical nitrogen is prohibited by the order.

RATES OF APPLICATION

Group A crops will have priority as to fertilizer use. They are entitled to the usual or customary rates of application or to the rates of application recommended by State experiment stations, and to grades that are authorized by the grade substitution plan.

Producers of Group B crops may use mixed fertilizers containing chemical nitrogen or nitrogen materials, provided that during the 1940–41 or 1941–42 seasons they used such fertilizer on Group B crops or that it was used on these crops on the farms they are now operating. This means that a farmer who has not in the past used chemical nitrogen fertilizer on B crops will not be entitled to use it on B crops this year.

For Group A crops, excepting soybeans, peanuts, and cotton (1⅛ inches or longer) farmers may obtain fertilizer containing chemical nitrogen up to the quantities recommended by the State agricultural experiment stations. For Group A cotton, the quantity that a farmer may obtain is based either on his past rate of application or the rate customarily used in his area. For soybeans and peanuts the basis is the farmer's customary rate of application or the recommendation of the State experiment station.

For Group B crops the quantity of fertilizer that a farmer may obtain is, generally speaking, based on the rate of application used on the farm during either the 1940–41 or the 1941–42 season.

The use or delivery for use of chemical nitrogen fertilizers on melon or cucumber crops, except where grown for seed production or, in the case of cucumbers, where grown for processing, is prohibited.

RESTRICTIONS ON USE

In ten North Central States—Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin—not more than half of the mixed fertilizer containing chemical nitrogen for use on field corn may be delivered before April 1, 1943.

Prior to May 1, 1943, not more than 75 percent of a farmer's requirements of chemical nitrogen as straight material can be delivered or used on field corn or cotton of varieties which normally staple less than 1⅛ inches.

Farmers are required to use the grades of fertilizers which are approved for each of 38 States. The States for which no lists of mixed fertilizer have been approved are: Montana, Wyoming, North Dakota, South Dakota, Nebraska, Kansas, Colorado, Utah, Nevada, and New Mexico. There are no restrictions as to the sale of mixed fertilizers in these States.

No *chemical nitrogen* fertilizer can be used on golf courses, cemeteries, lawns, roadsides, parks, or on non-commercial plantings of trees, shrubs, or flowers. Fertilizers for use on military grounds and air force stations are exempt from all provisions of the order.

Town and city gardeners may now purchase only one grade containing *chemical nitrogen*, namely, 3–8–7, and it must be used for food production only. The first figure represents the percent of nitrogen, the second the percent of phosphoric acid, and the third the percent of potash. Gardeners may

(Continued on page 262)

FAMED LANCASTER COUNTY ACCEPTS WAR CHALLENGE

BY W. MARTIN MUTH [1]

Good grass helps to boost wartime milk production on the farm of Enos Groff.

IT IS FITTING that Lancaster County, Pa.—celebrated from coast to coast for its agriculture—should have a soil conservation district whose cooperators are mainly concerned with setting some sort of record in war production.

The Lancaster district covers 15 townships containing 2,930 farms and 183,565 acres. From a beginning of three farms totaling 271 acres, for which agreements were made in November 1939, the district has grown to include 275 cooperating farms and 31,303 acres.

Significant is the fact that conservation methods continue to rise in favor as production needs become more urgent. Last year 57 new cooperators brought 7,302 more acres under conservation planning.

Particularly good examples of what a fine agricultural community can do to supply the demand for new crops to meet specific wartime needs are found in Lancaster's experience with two crops in 1942. Soybeans for oil were increased 300 percent. Belladonna, a crop never before grown in Lancaster County, was planted on 200 acres; the satisfactory yields obtained have been of material assistance to the Government in helping to provide an important drug.

Success in attaining generally increased crop yields for 1942 promises well for still greater production in 1943. As compared with 1941, typical increases for Lancaster County last year were 15 percent for sweet corn, 20 percent for peas, 25 percent for tomatoes, and 3 percent for potatoes. As for livestock, beef was up 5 percent, cows 10 percent, dairy products 12 percent, poultry 8 percent, and hogs 7 percent.

The following comments by district cooperators are typical of many reported to district offices.

"Yields are higher on wheat, corn, tomatoes and other crops . . . most efficient way to save moisture I have ever seen . . . a team can do 20 percent more on the contour."—Donald Weicksel, Christiana.

"Corn at least 15 percent better and tobacco 200 to 300 pounds an acre more than when farmed in square fields . . . hay yields doubled."—George Cramer, Pequea.

"Strip fields and contouring increased yields of corn, tomatoes, tobacco, especially tobacco . . . got 2,400 pounds of tobacco to the acre, 70 tons of tomatoes on a little more than 4 acres . . . easier to work in contour fields, and I save 10 to 15 percent on fuel too."—Arthur Brown, Nottingham.

As a means of keeping cooperators up-to-date with recent conservation developments and to promote interest within the district, a series of 10 educational

[1] District conservationist, Lancaster, Pa., Soil Conservation District.

meetings was held last winter. Each meeting was held in a different township so that everyone interested could conveniently attend. The large attendance and the interest of those present proved the soundness of the idea. Each program was led by a district supervisor and a farm planner was present to discuss technical matters. A representative from the AAA spoke on the AAA program for 1943. Moving pictures were shown, including "The Heritage We Guard," "Wartime Farming in the Corn Belt," "Muddy Waters," and "The Living Land." The meetings concluded with general discussions by farmers and panel leaders.

In January, the supervisors sent a letter to all cooperators, warning against plowing adjacent contour strips in the effort to meet production goals for cultivated crops. The letter pointed out that planning crops so as to maintain alternate strips of close-growing and cultivated crops will accomplish more to aid the war effort and will better protect the farmer's investment.

The importance of this caution is reflected by the fact that 8,415 acres within the district are cultivated on the contour, and 7,289 acres have been strip-cropped, involving 180 acres of obstruction removal. There are ten miles of diversion ditches, four miles of terraces, and over 9,000 feet of outlet channels.

The Lancaster cooperators appreciate that it saves labor and machinery to have good pasture land for stock, rather than unnecessarily to supplement poor pasture with cropland products for feed. Fertilizing and liming have accordingly been increased, thus aiding the war effort by improving both the yield and the quality of pastures. Contour furrows on 191 acres help pasture growth through retention of moisture.

Cover crops are being used extensively on many district farms. Rye-grass is the most generally favored cover, being sown 15 to 20 pounds to the acre following the last cultivation of corn.

Within the past year a satisfactory working agreement has been reached between cooperators, district supervisors, and State Highway Department for the control of water run-off and silt deposits on highways when the source is adjacent farmlands. The district helps the cooperator plan for control, and aids with labor, equipment, and materials. The Highway Department cooperates in maintaining control along the rights-of-way.

War production by conservation methods, as practiced on the farm of Ezra Hershey.

Belladonna, important drug plant, was grown on 200 Lancaster County acres last year.

What conservation farming can do to help the Highway Department in Lancaster County is attested by Charles D. Shriver, caretaker of highways in two townships within the district. "It cost over $350 in a single summer to haul away silt washed onto the road from the fields of one farm which did not employ conservation methods," said Shriver. "But there was no mud or silt to be cleaned from the road ditches bordering the adjoining farm, which had contouring and diversion ditches to protect the farmland. I have 28 miles of improved road to look after. Over $2,000 road maintenance a year would be saved if all the farms along these roads had conservation farming in effect every place it was needed."

The supervisors of the Lancaster district are now pushing a program for widespread application of

Strip cropping and contour cultivation as Lancaster County knows it. One of the farms shown here is owned by Hartwell E. Roper, district cooperator.

conservation practices. Whereas formerly they required a complete soil and moisture conservation plan, today they are assisting with any phase of conservation in which farmers are interested, be it one or more practices. For instance, a farmer who requests assistance for control of erosion in one field will be given such assistance, even though only one phase of conservation is to be involved. During the 1943 crop season, strip cropping and contour farming particularly are expected to be on the increase, due to interest shown in these two practices by the farmers within the district, and because of payments for such practices offered in the AAA 1943 program.

An association originally limited to cooperators and organized to handle lime distribution in a soil conservation project, having accomplished its purpose, has just been reorganized as the Lancaster County Land Conservation Association. With membership now open to farmers and others interested in the conservation of natural resources throughout the county, the new organization aims to further the conservation movement in all its forms not only within the district but throughout the entire county. It is affiliated with the Pennsylvania Land Conservation Association. Its board of directors will include representatives of each of the 15 townships within the district, and each member of the board will be responsible for the work of the conservation movement within his own township. It will undoubtedly be worth following the development of this organization, which is one more example of the spirited determination of the farmers within the Lancaster Soil Conservation District to further every means of advancing the war effort through conservation.

ACRES ARE ACES

(Continued from page 248)

One of the biggest chunks of the United Nations cropland assets is right here in the United States—the Corn Belt—an area which stretches from Central Ohio west to Central Nebraska, and from Southern Minnesota south to Southern Missouri, a total of more than a quarter million square miles, the largest piece of fine farm land in the world with a good agricultural climate. That one patch of land, which produces enormous quantities of corn, hogs, poultry and eggs, milk, cheese, beef, soybeans, flax, fruits and vegetables, looms large in the calculations of the United Nations high command; for when you get right down to brass tacks, it may well figure out that the vital supplies that spell the difference between success or failure will come from those millions of acres in just one part of the country.

Acres are aces in this grim game, and we of the United Nations hold the aces, but we must play them right. It is even more dangerous to spend soil resources extravagantly than it is to spend money extravagantly . . .

SEED FOR CONSERVATION PRODUCTION

(Continued from page 251)

has prevented rapid increase in past years. Recently improved strains of bromegrass developed under this arrangement have been placed with farmers in soil conservation districts in Iowa to secure as rapidly as possible sufficient seed for commercial production. The same arrangement applies to other grasses and legumes wherever improved strains are available and increased seed supplies are needed.

The Soil Conservation Service has been authorized and instructed by its Chief to include seed production in its conservation-production activities. Other bureaus of the Department will also be working in this direction and every effort should be made to develop a departmental seed-production program. It will involve cooperation with State agencies that are also interested in seed production as a part of the food production program. Soil conservation district supervisors will be anxious to facilitate seed production in the districts and they should be given all possible assistance. Let's make a real effort, individually and collectively, to be of all possible assistance in the production of ample seed supplies that are so urgently needed to meet the tremendous demands for food and feed to win the war.

FERTILIZERS FOR 1943

(Continued from page 258)

also buy any grade containing *only organic* nitrogen and use it either for food production or for fertilizing the lawn, shrubbery, or trees.

Farmers may use on their gardens any grades of fertilizer which they may lawfully purchase for use on crops.

Farmers who desire to purchase fertilizer materials for home mixing may do so provided that the amount of chemical nitrogen purchased does not exceed the amount which each farmer would be eligible to purchase in the form of mixed fertilizer.

Any mixed fertilizer containing *organic nitrogen only* may be sold or used provided it contains at least 3 percent of nitrogen and 14 percent of total plantfood.

The lists of grades which have been approved for the various States and recommendations concerning their use have been given wide publicity within the States and are not repeated here.

March reports showed 2,396 men and women of the Soil Conservation Service on uniformed duty with the Army, Navy, Marine Corps and Coast Guard; 7 killed in action; 2 prisoners of war somewhere in Japan. Every day the totals increase, as reports of new inductions or enlistments come in.

Consciousness of the personal sacrifices being made by Service employees on the fighting fronts undoubtedly had much to do with the outstanding success of the recent Red Cross War Fund campaign. "We went over the top," commented the Chief, "not only a hundred percent but more, at a time when rising prices, income tax, and other financial worries made the outlook none too bright. I salute your patriotism, your efforts, and your belief in our democratic manner of living."

Henry V. Kent, Montgomery County, Miss., estimates that $165 expended for use of a tractor and bulldozer in carrying out a drainage plan on 100 acres will be worth at least $500 a year to him. It enabled him to increase corn production from 500 to 1,500 bushels, and to convert to pasture 20 acres formerly used for row crops.

J. M. Harrison, Johnson County, Ga., has a 75-acre pasture that is carrying three times as many cattle this year as before, because of a pasture improvement program worked out with the assistance of SCS technicians in the Central Georgia soil conservation district. Livestock was increased from 20 to 61 head grazing continuously, and it could have carried 10 to 20 more, according to the owner, who estimated that 120 could be carried easily for a period of 90 days.

"The young Hereford steers grazing the improved pasture have made a fourth to a third more weight than those on my old pasture," said Mr. Harrison. "They are of heavier build and will make heavier stock at maturity."

Edward G. North, Punxatawney, Pa., finds that it requires less power to farm in contour strips. He sold a hay loader several years ago because he was unable to use it in his square-field, up-and-down layout. It was too much for his team. Since he began farming on the contour, he has bought another hay loader and now uses it with either team or tractor. He cuts grain on contour strips with one team and a 7-foot binder.

During the 5-year period ending in 1940 a group of farmers in the LeRoy, Ill., soil conservation demonstration project area who had been using a complete protection program averaged a net income of $1,911 a year. A similar group of farmers in the same county, who prided themselves on their straight furrows, made an average annual net income of $1,277. That is a $634 margin each year in favor of conservation farming for that 5-year span.

Conservation has done something for a 312-acre farm near Roscoe, Ill., that 5 years ago produced only "a crop of sandburs and weeds." Today it grows feed aplenty for a fine herd of 42 Guernsey milkers, 40 head of young stuff, 110 fattening porkers.

Near Shenandoah, Iowa, 66 men who farmed the conservation way averaged $2,141 net income in 1940. Fifty-seven farmers who did not have a conservation plan netted $1,694 each.

U. S. GOVERNMENT PRINTING OFFICE: 1943

For REFERENCE

Compiled by ETTA G. ROGERS, Publications Unit

Field offices should submit requests on Form SCS–37, in accordance with the instructions on the reverse side of the form. Others should address the office of issue.

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Around the hill to Victory! Throughout the Nation farmers are employing contour—on the level—farming to hold soil, water, and fertilizer on the land, and to bring to bear the new knowledge of how to increase crop yields through conservation methods. Under stress of war necessity a modern agricultural pattern is being spread across rural America. Old wasteful methods are being abandoned not only for the duration but forever on thousands of farms which will never again permit the prodigality of the thoughtless rip-and-tear era.